Zero Retries issue 0160 2024-07-12

Zero Retries is an independent newsletter promoting technological innovation that is occurring in Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology. Now in its ~~third~~ fourth year of publication, with ~~1800~~ 1900+ subscribers. Radios are computers - with antennas!

About Zero Retries

Steve Stroh N8GNJ, Editor

Jack Stroh, Late Night Assistant Editor Emeritus

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Web version of this issue - https://www.zeroretries.org/p/zero-retries-0160

Request To Send

Commentary by Editor Steve Stroh N8GNJ

Paid Subscribers Update

My thanks to **Prefers to Remain Anonymous 05** for renewing their Annual Paid Subscription to Zero Retries this past week!

My thanks to **Prefers to Remain Anonymous 36** for becoming a new Paid Subscriber to Zero Retries this past week!

My thanks to **Prefers to Remain Anonymous 37** for becoming a new Paid Subscriber to Zero Retries this past week!

Financial support is a real vote of confidence for continuing to publish Zero Retries.

Major Conference Countdowns

- **JARL Ham Fair 2024** in Tokyo, Japan on 2024-08-24 and 25, in *6* weeks!
- **Digital Communications Conference (DCC)** in Knoxville, Tennessee on 2024-09-20 and 21, in 10 weeks! The DCC will be held in conjunction with GNU Radio Conference 2024 (GRCon24).
- **Pacificon 2024** in San Ramon, California, USA on 2024-10-18 thru 20 in 14 weeks. Tina KD7WSF and I plan to attend Pacificon 2024 (which makes it "major" to us).

Recent updates in the Zero Retries Guide to Zero Retries Interesting Conferences include these events:

- HamCon:Zion 2024
- Great Plains Super Launch 2024
- Grassroots Radio Conference 2024 (GRC2024)

- Hackaday Supercon 2024
- 2024 AMSAT Space Symposium and Annual General Meeting

Zero Retries Readers in Certain States Needed

Glancing at one of the *many* obscure status pages for Zero Retries in Substack - **Audience Insights**, this statement got my attention:

> **Location**
>
> Zero Retries is read across 49 US states and 58 countries.

49 states??? I clicked into that section to find out who the holdout state was, and actually there are several Zero Retries "holdout" states (have no Zero Retries subscribers):

- Alaska
- Mississippi
- New Hampshire
- New Mexico
- North Dakota
- South Carolina
- Vermont
- Wyoming

I'm a bit skeptical of this metric, given that Substack only knows about email addresses and IP addresses when you read or click on an issue of Zero Retries. "Registration" with personal identifying information, like address, isn't required for subscribing to Zero Retries.

Still, if you know of a co-conspirator that might be interested in Zero Retries, located in the Zero Retries holdout states, please put in a good word for Zero Retries 😄.

"According to these stats", the most popular state for Zero Retries (14%) is California. Washington and Oregon are tied for second most popular state - 8% for each of them.

Worldwide, Zero Retries is still pretty obscure, though it's making some inroads, with *one subscriber each* in:

- Argentina
- Chile

- Hungary
- Norway
- Romania
- South Africa
- South Korea
- Sweden
- Switzerland

Again, these stats are highly suspect; despite a subscriber count of 1800+, per this report there are 275 subscribers in the US. And no subscribers in Peru - *bummer!* The map was skewed to the point where I couldn't find several countries despite browsing the cursor in the areas where I know some small countries are located.

But it was kind of fun to look at this.

Thank you again, Zero Retries subscribers!

Beginning the Fourth Year of Zero Retries - With *1900+* Subscribers!

I once read a story[1] about Steve Jobs that when he became CEO of Apple (again), he was checking out his new offices and came across a closet full of older Apple units that were being saved for an eventual on-premise Apple Museum. The story goes that Jobs told his assistant to get rid of them, donate them somewhere. The memorable part of that story, to me, is that Jobs reportedly said that "If you look backwards in this industry, you'll get run over" (or "you'll get killed", or something to that effect).

I thought about that pearl of wisdom from Jobs this week as I approached the 3 year anniversary of Zero Retries (2nd Friday of July) and am now faced with how to deal with the legacy of securing hundreds of issues of Zero Retries into archival form. I was discussing with a trusted advisor to Zero Retries on how best, and most efficiently, to secure those past issues issues into a permanent archival form, safe from the vagaries of Substack. I felt like Jobs did upon seeing that closet full of computers; time spent dealing with the Zero Retries archive is time away from creating *new* material for Zero Retries, and of course the fun of Amateur Radio activities. But unlike Jobs, creating archives of Zero Retries is a unique task that falls to me (though the trusted advisor suggested outsourcing this task).

I don't have any profound insights to offer for Zero Retries having been in continuous weekly publication for three years now; just a few minor insights.

The first is that I periodically need to emphasize to Zero Retries readers that most of what I'm writing about in Zero Retries is largely exposing technological innovation in Amateur Radio that *others* are *doing* that isn't being reported on elsewhere. I periodically offer some of my

own thoughts about technological innovation that I'd like to see Amateur Radio go in… but beyond Zero Retries, *my* contributions to technological innovation in Amateur Radio are pretty modest. There have been a few surprises, such as Mark Herbert G1LRO creating an Amateur Radio Data Appliance that I only imagined:

> In this article by Steve Stroh N8GNJ, Steve sets out the functionality required to create the Amateur Radio Data Appliance, being:
>
> - Power supply
> - Battery backup
> - Radio transceiver
> - Modem
> - Embedded computer with a minimal display for status / health / troubleshooting
> - Networking required to for remote access via "household" network (not Internet)
> - Most of all, cabling to interconnect all of the above

And, as you'll read, I had actually imagined something vaguely like Digital Library of Amateur Radio & Communications (DLARC), but I did not imagine the scope of what DLARC has become, and how wonderful it is to have DLARC as a publicly accessible resource.

Although I had nothing to do with the creation of Open Source in Amateur Radio wiki, I had imagined and written briefly that such a directory was needed to be able to easily locate *existing* Amateur Radio Open Source projects to lessen the "reinventing the wheel" issue of creating multiple implementations of the same system. I had advocated for funding such a thing with a grant or direct involvement of ARDC, but that went nowhere, and this project is simply a better realization of my idea.

All that said, I do have some plans for doing a little of my *own* technological innovation in Amateur Radio that I hope to make a bit more real during Summer 2024.

When I began Zero Retries, I had a lingering fear that I would run out of interesting material to report on. I began with a substantial queue of interesting things to write about, but I wasn't sure what would happen when I emptied that queue 🤣 - would there still be interesting things continuing to occur that I could keep Zero Retries going? This actually happened two decades ago with my Digital Wireless column in CQ Magazine. I actually *did* run out of things to talk at times, which caused friction with CQ's editor about missed deadlines. The good news is that in the 2020s, the rate of technological innovation in Amateur Radio is such that the queue has kept *growing*, not reducing. The bad news is that caused the opposite problem to what I feared - *there are too many things to write about*, with not quite enough time and never enough space in Zero Retries as an email newsletter.

Another minor insight is that I now have confidence that I *can* sustain a weekly publication schedule, being able to say something of substance about technological innovation occurring in Amateur Radio.

Yet another minor insight is that I must be doing something right given the subscriber count keeps growing - now at ***1900+***. When I began Zero Retries, I did not imagine *that* level of interest; I only imagined perhaps a few hundred subscribers would share my specific interests in Amateur Radio… but apparently I didn't dream big enough.

Speaking of "Dreaming Bigger"…

I have some short term plans for the Zero Retries ecosystem:

- My book - **Zero Retries Guide to Amateur Radio in the 21st Century** is still in progress. I recently discovered an interesting service that can publish a book online (beyond a simple PDF on a website) that might speed up my progress to allow posting incremental updates (chapters) as I complete them.

- I've been threatening to create an email list on groups.io for Zero Retries, and that is now imminent.The first tranche of invitations will go out to the paid subscribers as a Thank You for their financial support of Zero Retries. Eventually the Zero Retries email list will be opened to all Zero Retries subscribers. My idea is to post the headlines / links there each week and let the discussions between subscribers commence in a more interactive, easy to access system. The Comments section of Zero Retries on Substack has proven problematic for a lot of folks who don't want to "get involved" in Substack's ecosystem for various reasons (and I don't blame them). I also plan to offer "requests for comments" for upcoming articles in Zero Retries in which I invite folks to contribute ideas and background on subjects that I need help in understanding. Zero Retries can sometimes come across as a "one man show" but believe me, *I lean heavily* on advice and expertise of others when I'm trying to understand and explain a deeply technical subject on Zero Retries.

- Kay Savetz K6KJN and I have decided to do a podcast called **Store and Forward**. We conspired that we can offer a unique combination of looking back at Amateur Radio (from the perspective of DLARC) - "Store" and the future of Amateur Radio (from the perspective of Zero Retries) - "Forward". The prototype episode of Store and Forward is online in DLARC. Initially (Summer 2024) we'll be recording biweekly. The longer term logistics - website, podcast feed, etc. will be worked out. Both K6KJN and I have busy summer plans (some intense travel ahead for K6KJN, as you'll read) and I just have a lot of catching up to do in N8GNJ Labs to take advantage of the summer weather interlude between the Whatcom Winds / Monsoon Rains seasons. Thus the publication schedule of Store and Forward might be a little irregular initially.

Using DLARC, Amateur Radio Operators are Resurrecting Technical Ideas from the Past, Using 21st Century Tech

I recently wrote a brief note of thanks for the existence of DLARC within the Internet Archive

to Brewster Kahle, Founder and Board Chair of Internet Archive:

> I just wanted to drop a note to you and IA in general as a Thanks for creating and maintaining the Digital Library of Amateur Radio & Communications within IA.
>
> DLARC has proven to be an absolute godsend of archival information for Amateur Radio (despite the stubborn resistance of the ARRL… which I'm working on). One of the most valuable aspects of DLARC is reading about technologies and projects that were mere dreams or not-quite-successful decades ago that can be realized now with current technology such as cheap embedded processors and FPGAs and Software Defined Radio technology.
>
> I use DLARC multiple times per week… and contribute to it regularly, working with Kay Savetz to periodically send in material from my Amateur Radio collection that DLARC doesn't already have.

Kahle replied and wondered if my "dreams" perspective might be expanded into a post on the Internet Archive blog, and I agreed.

That article is now online - Using DLARC, Amateur Radio Operators are Resurrecting Technical Ideas from the Past, Using 21st Century Tech. *A Thank You to Internet Archive's Digital Library of Amateur Radio & Communications*.

Excerpt:

> One of my favorite ways to use the DLARC (nearly 120,000 items now, and still growing) is to re-explore ideas that were proposed or attempted in Ham Radio, but for various reasons, didn't quite become mainstream. Typically, the technology of earlier eras simply wasn't up to some proposed ideas. But, with the technology of the 2020s such as cheap, powerful computers and software defined radio technology, many old ideas can be reexamined with perhaps succeed in becoming mainstream now. The problem has been that much of the source material for such "reimagining" has been languishing in file cabinets or bookcases of Ham Radio Operators like me, with nowhere to go. With the grant, IA could hire a dedicated archivist and began receiving, scanning, hosting, and aggregating electronic versions of old Ham Radio material.

Kahle noticed the post, and commented:

> You are most welcome– thanks to ARDC, DLARC has been a huge success for other reasons as well: a possible model for other communities.
>
> Kay has made this a success, I believe, because he is both a knowledgeable ham community member, and embedded at the Internet Archive (he has the tech and social chops to get things through our internal processes).
>
> This is a first for us– and hopefully a model for archives to come.
>
> Thank you ARDC, Kay, and ham community.

I agree wholeheartedly - while ARDC provided the funding with a grant, and IA had the infrastructure to host DLARC… **K6KJN has made DLARC a success**.

Not Much Zero Retries Interesting Reported from HAM RADIO 2024

I'm surprised that not much that was Zero Retries Interesting was reported out of HAM RADIO 2024 which concluded 2024-06-30, at least that I'm aware of. No new Zero Retries Interesting products, or Zero Retries Interesting new vendors, etc. Admittedly I haven't watched the walkthrough videos that have been posted (they're queued up in a too-deep queue of videos to watch), but I would have thought that there would be some exciting developments reported. If I missed something, please Zero Retries readers, let me know so I can share it here in Zero Retries.

Another 21st Century Telecommunications Option for N8GNJ Labs?

Most of the summer, Northwest Washington where we live is blessed by a mild summer climate, so we mostly sleep with the windows open to the fresh cool air overnight. One morning last week we awoke to hearing some voices in a small group on the edge of our property. To my delight, the voices turned out to be a survey crew from Ziply Fiber who apparently is considering bringing in fiber to our neighborhood and down our private street.

In contrast, Comcast's infrastructure in our neighborhood is solely serviced by "well aged coaxial cable" with a fiber / coax transition well outside the neighborhood. A neighbor was experiencing significant issues with their Comcast service and reported to me that Comcast would constantly play the "reset your router and in 10 minutes it should be OK" game, replacing the router, etc. - everything to forestall sending out a technician who discovered that a previous technician had disconnected the first neighbor's coax to bring a new neighbor online whose house previously didn't have Comcast service. Thus switching to Starlink for my household was a relief from the vagaries of Comcast "service" over "well aged coaxial cable".

If Ziply *Fiber* does become available on my street (I've heard of Ziply not actually deploying fiber as promised), that's going to be a tough decision not to opt for that, if for nothing else than greatly improved uplink speeds beyond what Starlink is capable of given that I eventually plan to do video production. But it's possible Starlink might tinker with their service plans with a more affordable price than the current $120/month for unlimited usage. I'd happily accept a transfer cap for mostly standby (or solely Amateur Radio) use for a lower price such as the $30/month Starlink currently charges for use of the new Starlink Mini user terminal.

The Random Wire Newsletter (and now *Podcasts!*) - Zero Retries Interesting, and Recommended

I've recommended The Random Wire newsletter (and now, *podcasts!*) in Zero Retries and would like to do so again here. Tom Salzer KJ7T is doing a stellar job exploring various aspects of Amateur Radio that I simply don't get around to, or have much depth to offer, here in Zero

Retries. One example is KJ7T's regular coverage of radio hotspots for Amateur Radio Over Internet such as AllStarLink, covered so well that instead of trying to cover that subject in Zero Retries2, I'll defer to KJ7T's much better knowledge of the subject, and his constant experimentation with different aspects of Amateur Radio Over Internet.

I've said before that I probably wouldn't have started Zero Retries if the stuff I'm interested in was covered adequately in other Amateur Radio media. The Random Wire is an excellent example of exactly that - covering subjects I'm interested in *so well* that I can just read it (enjoyably) and learn from it instead of having to research it to write about it. I've also been enjoying KJ7T's foray into podcasting, following his adventures with microphones, recording, etc. Given our geographic proximity, I hope to meet up with KJ7T face to face sometime this summer. I think that if you enjoy the subject material in Zero Retries, you'll find ample Zero Retries Interesting material in The Random Wire and I recommend that all Zero Retries subscribers also subscribe to The Random Wire.

73,

Steve N8GNJ

Leave a comment

Share

Image courtesy of Internet Archive / Digital Library of Amateur Radio & Communications

What's New at Digital Library of Amateur Radio & Communications - July 2024

By Kay Savetz K6KJN

Greetings from DLARC World Headquarters, which has three big things going for it: a fast Internet connection, air conditioning, and cats to pet. In the past few weeks, I've added a wide variety of ham radio material to DLARC. Here's a peek at some of it.

The DX Bulletin (TDXB) was written and published by Jim Cain, K1TN. He published 324 issues from 1979 to 1986. He scanned the entire run — about 1500 pages — years ago. The scans have been hosted by The Yasme Foundation, a non-profit that conducts scientific and educational projects related to amateur radio. Mr. Cain and Ward Silver of The Yasme Foundation agreed it would be a good idea to make the newsletters available at DLARC as well. Mr. Cain told me that in retrospect, the name The DX Bulletin was too generic — many other publications have had similar names over the years — and maybe he should have titled it "Jim Cain's Weekly DX Screed." By any name, it's a fascinating read and DLARC is better for its inclusion.

Cain is also the author of the book "YASME, The Danny Weil and Colvin Radio Expeditions" which is now downloadable from DLARC with his permission. From the back-of-book blurb: "This is the history of three travelers spanning the birth of YASME — the boat that carried young sailor Danny Weil on his first voyages beginning in 1954 — and the lives of famed ham radio DXpeditioners Lloyd and Iris Colvin."

DLARC has added 217 issues of the "Blown Fuse" newsletter from the East Bay Amateur Radio Club out of El Cerrito, California. Some of them were PDFs on their web site. For the older issues that were only available on paper, the club lent us a hefty stack of newsletters to scan, some of which go all the way back to 1964. We've also added 113 issues of the Minnesota Amateur Radio Technical Society newsletter. The 12-year-old group is based in Minnetonka, MN.

Sometimes a simple newsletter donation turns into a whole little project. California Historical Radio Society donated, and we scanned, 35 issues of Spark Gap Times, which was the newsletter of the Old, Old Timer's Club. That organization started in 1947. At the time, the requirement for membership was proof of two-way communication by wireless 40 or more years *prior* to 1947. I can only assume that specific requirement was relaxed as the years passed.

The OOTC web site is gone now (replaced by a spammy ad for a sportsbook) and I guess that the organization is now defunct. The OOTC site's last capture in the Wayback Machine was just this May. So I scoured the site in Wayback, found another 44 issues of Spark Gap Times, and added those to the collection too. Thanks to the California Historical Radio Society for the

donation of those first 35 issues which started me down this rabbit hole.

Here's a special treat for our esteemed editor, Steve Stroh: last year he donated three issues of the Texas Packet Radio Society "Quarterly Report" newsletter. TPRS was devoted to radio digital communications, and the creators of TexNet, a wireline/wireless hybrid networking project. Based on their site in The Wayback Machine, the group lasted from roughly 1996 to 2003ish. I scrounged 15 more newsletter issues from their Wayback'd web site and created the TPRS Quarterly Report newsletter collection. If you have more issues in any format, please let me know.

I was sorry to learn that Allen Katz K2UYH died in June. Katz was the publisher of 432 And Above EME News, and was a professor of electrical and computer engineering at The College of New Jersey. I am grateful that he gave permission to archive his newsletter in DLARC before he passed.

Somehow I've managed to write almost entirely about newsletters so far. Moving on to other topics.

DLARC has added all 99 episodes of the Ham Radio 360 podcast. This podcast ran from 2014-2018: it was a bi-weekly show created "for the new guy" hosted by Cale Nelson K4CDN. (Nelson recently launched a new podcast called PrepComms.)

Software Defined Radio Academy is an annual conference, since 2015, that covers all aspects of SDR. The hosts have done an admirable job of recording their conference's presentations over the years, and now those talks are archived in DLARC.

Meanwhile, the Internet Archive's scanning centers have been hard at work scanning thousands of magazines and books, which can be checked out using controlled digital lending in the DLARC Library. It would be folly to try to list them all, but I encourage you to browse around and see what's new. Of particular note are many books and journals about microwave communications, which were a generous donation from the family of James Beyer W9ADJ, who was a specialist in that field.

If you'll permit me a paragraph about a personal project that's only tangentially ham radio related: I found, recovered and digitized 53 episodes of "The Famous Computer Cafe", a radio show about home computers that was broadcast from 1983-1985. The hosts interviewed many of the big tech names of the day: Microsoft founder Bill Gates, Apple's Bill Atkinson, Atari VP James Copland, author Timothy Leary, author Douglas Adams, and more. From the news segments to the commercials, the shows are a perfect time capsule of the world of home computers in that era. One of the interviewees is Steve Roberts, a ham radio operator. From 1983 to 1991, he explored the United States on a computerized, radio-equipped recumbent bicycle named BEHEMOTH.

Next week I'll be leaving the cats and climate-controlled comfort of DLARC World Headquarters for Denver Colorado to retrieve pallets of material from the estate of Bob Cooper. Bob was an expert in satellite and cable TV communications, and publisher of Coops Satellite Digest. I already have a little start of a Bob Cooper collection in DLARC, but there's sure to be much more in the coming months as we begin to process and digitize what I find in Denver.

Digital Library of Amateur Radio & Communications is funded by a grant from Amateur Radio Digital Communications (ARDC) to create a free digital library for the radio community, researchers, educators, and students. If you have questions about the project or material to contribute, contact me at kay@archive.org.

Kay Savetz, K6KJN
Internet Archive's Program Manager, Special Collections
DLARC want list: https://archive.org/details/dlarc-wantlist

…

Editor's Note - K6KJN is too modest to mention this in this month's column (which is intended to highlight new material in DLARC), but unlike DLARC, the work of digitizing the 53 episodes of "The Famous Computer Cafe" (and potentially additional episodes should they be located), is *privately* funded, with some reimbursement from a successful GoFundMe campaign (donations currently closed). There's more detail about the rescue of TFCC there. Kudos to K6KJN for rescuing these treasures.

Bits Oughta Be *Just Bits*

By Steve Stroh N8GNJ

Some thoughts about the ideal interoperability of digital voice and data in Amateur Radio.

Digital repeaters are easier, and work better, than analog repeaters

I'm on an email list where the technical details of Amateur Radio repeaters are discussed… at times in *excruciating* technical detail. The discussion that inspired this article was about the minutiae required to keep a repeater signal and audio path absolutely "clean" for good retransmitted radio signal and good audio, including knowing about external factors that can influence the repeater's signal quality - down into the weeds to the point of debating the relative merits of different types of coaxial cable connectors.

I'm not disparaging the concepts being discussed or the folks offering the minutiae. But it struck me in reading the discussion that to a large extent, most of those details largely become moot if the repeater was operating as a *digital* system rather than analog (FM).

Disclaimer - Yes, I am acutely aware that one cannot entirely ignore the analog aspects of radio transmission. While digital systems can overcome some aspects of interference, or noise, or other radio issues… "making it digital" is certainly not a "cure all" for significant radio system issues such as major antenna and feedline issues.

In my highly *inexpert* opinion, almost all of the issues of the discussion I was following would simply not be an issue if that system were digital, largely because of the presence of Forward Error Correction (FEC) in modern digital radio systems. Minor noise issues on analog systems that are annoying to the point of the system being unusable (un-listenable) are simply not an issue with digital systems.

One of the most elegant digital techniques I know for Amateur Radio digital repeaters is the idea of receiving a digital signal and then applying bit regeneration *at the repeater*. which permits the transmitted signal from the repeater to be perfect, even if the signal received at the repeater wasn't perfect. (Yes, I understand that there's a threshold beyond which the FEC cannot help.) I featured an excellent article about bit regeneration in **Zero Retries 0147** - Advantages of a Bit-Regenerating Repeater for Local Area Networks that explains the concept well, despite predating the now-common use of FEC.

But beyond the "digital fixes analog issues" factors, digital radio systems offer the (theoretical) advantage of being able to do data in addition to digital voice.

***Bits Are Bits* - once it's digital, the bits should be agnostic.**

Think about how different types of data is handled by TCP/IP and by extension, the Internet. We take it for granted that the same high speed TCP/IP connection into our homes, offices, and shacks can easily handle *realtime voice* (and video) bits, *recorded voice* (and video) bits, *email* bits, *file download* bits, *photo* bits, *realtime telemetry* bits, etc. That's because TCP/IP *generally*[3] treats all bits the same. It doesn't care what the bits are supposed to be part of in the end, it just moves the bits from point A to Point B.

In Amateur Radio, we haven't done voice / data mixing and matching particularly well to date. When there is a data capability in an Amateur Radio digital voice system, to date, data has been an afterthought. In the oldest Amateur Radio digital voice system - D-Star, there is a 900 bps data stream accompanying the (3600 bps) digital voice stream. Roughly two decades after its introduction, Icom quietly slipstreamed "DV Fast Data" mode into some radios[4] which allows the digital voice stream to also be used for data. System Fusion's data capabilities are "locked" to only support transport of images and some telemetry data such as APRS. DMR and P25 have data capability in their respective system and protocol specifications. In those systems, digital voice interoperability was extensively tested and required, but data capabilities were left to individual vendors such as Motorola and Hytera to implement a usable data option.

This is somewhat understandable - Amateur Radio has been doing voice over radio for about a *century* now, and data for nearly as long (Radio TeleTYpe - RTTY was used extensively in World War II). But with the technology of the 2020s and beyond, we can do better, and I posit we should do better. Amateur Radio shouldn't remain stuck in a frame of reference from the 1960s that "repeaters are for voice"[5].

Sidenote - Repeaters are for voice, Digipeaters are for data is a *specious* premise.

There is a "blind spot" with many Amateur Radio Operators that think that because data systems like packet radio *can* use digipeating to extend range, that data systems *should* use digipeating, and not use (simultaneous receive / transmit) repeaters to extend range of data systems.

Digipeaters can work well if they are very lightly loaded, but if there is significant usage of a digipeater, it begins to be subject to Hidden Transmitter Syndrome (Wikipedia calls this issue Hidden Node Problem).

A simple thought experiment can demonstrate what a specious premise this is. There have been

"simplex voice repeaters" for decades, ever since we've had microprocessors that can record a transmission, and replay it back onto the same channel. It's a poor experience at best, obvious because *we can hear the poor result*. No one likes using a simplex voice repeater, and will go to the trouble and expense to create a full duplex repeater instead. Digipeaters for data are no different in suffering from the poor effects of *receive* / *buffer* / *retransmit* on a simplex channel. It's just that with data, the effects are hidden by the data devices.

…

We're getting a bit better about making data equivalent to voice in Amateur Radio. As discussed in **Zero Retries 0159** - M17 Data Modes, M17 can do both voice and data within the M17 protocol / systems. FreeDV is a digital voice mode for HF communications, and the modem for dealing with HF conditions is so good that there's now work underway to use the FreeDV modem for data - FreeDATA. I'm not aware that FreeDV and FreeDATA are going to be made interoperable - send voice, or send data, interchangeably from the same app / system, but in my opinion, that should be a goal.

But the most recent such development was (welcome!) recent news from Open Research Institute about their ongoing project called Opulent Voice (emphasis mine):

> **Opulent Voice Flying High**
>
> Opulent Voice is an open source high bitrate digital voice (and data) protocol. It's what we are using for our native digital uplink protocol for ORI's broadband microwave digital satellite transponder project. Opulent Voice has excellent voice quality, putting it in a completely different category than low bitrate digital communications products such as D-Star, Yaesu System Fusion, and DMR. Opulent Voice can be used on the 70 cm band and above.
>
> *Opulent voice switches between high resolution voice and data without requiring the operator to switch to a separate packet mode. Opulent voice also handles keyboard chat and digital file transmission. Seamless integration of different data types, using modern digital communication techniques, differentiates Opulent Voice from any other amateur radio protocol.*

(It's not explained why ORI says Opulent Voice can only be used on "70 cm band and above", possibly because the US FCC currently applies too-restrictive limits on bandwidth and data rates on VHF / UHF bands below 70 cm. Such limitations are generally not an issue outside the US, and hopefully that issue will be fixed in the US soon.)

Yes! *YES!!* ***YES!!!*** Someone finally *gets* this fundamental issue of being able to seamlessly mix digital voice and data, *designed in from the beginning!!!* Kudos to Open Research Institute for sponsoring this project, and to the developers who have pulled this off! I have previously not studied Opulent Voice very deeply because I was unaware of the data capability, only that it was higher quality digital voice system for Amateur Radio. But now, I will investigate Opulent Voice more deeply.

Also, it's probably kind of assumed / understood that Opulent Voice is *open source*… from the *Open* Research Institute… but in Opulent Voice, like M17 / FreeDV / Codec 2, there's *no*

dependence / usage on a proprietary CODEC (chip) as there is with DMR, D-Star, System Fusion, etc. *That* factor is a *third* significant differentiation, beyond high quality voice and integrated data capability, of Opulent Voice from DMR, D-Star, SF, etc.

Gosh I look forward to sitting down at my Amateur Radio station, tuned to the local repeater, seeing a dashboard of who was recently on the repeater realtime… and reading my emails and bulletins that have queued up waiting for me… *all on the same system! That* will be a dream, realized.

Leave a comment

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ZR > BEACON

By Steve Stroh N8GNJ

Short mentions of Zero Retries Interesting items.

RFBitBanger Batch 2 Kits Available

> Kits are available at our eBay store at this link
> https://www.ebay.com/itm/364783754396
>
> Be a part of the future with a prototype Batch 2 kit build of the RFBitBanger, a low-power high-frequency digital radio by Dr. Daniel Marks KW4TI. Presented by Open Research Institute, this kit is designed to produce 4 watts of power and opens up a new digital protocol called SCAMP.
>
> **SCAMP Is now available in FLDigi!**
>
> …
>
> SCAMP is a new protocol that allows keyboard-to-keyboard contacts with a digital protocol that has excellent connection performance. See Dr. Marks presentation [link added to original text] about RFBitBanger at QSO Today Academy in September 2023 to learn more about SCAMP and the RFBitBanger project.

Open Research Institute has been *busy* lately, between Opulent Voice and now making RFBitBanger widely available… with the new SCAMP data mode! And as you'll read at the link, a significant present at DEFCON32.

Project Yamhill Progress Continues

> The biggest news by far is that I finally was able to submit my large PCB order for manufacturing. It was put off a lot longer than I was hoping for, because I kept

finding small changes that I needed to make. However, I didn't want to fall into the trap of analysis paralysis, so I had to commit to getting it pushed to manufacturing in order to not completely lose momentum.

I've been following Jason Milldrum NT7S' progress on this ambitious project of a new low power HF radio, completely from scratch, fascinated by the detailed explanations of his design choices and the results (and sometimes, non-results) of his development process. I'm learning a lot from the insights into his development process that other developers don't offer - NT7S is a great writer. NT7S' newsletter Applied Ethics is Zero Retries Interesting, and recommended!

THE WORLD OF FREE PACKET SOFTWARE IN AMSTERDAM

This is an impressive archival collection of packet radio software, and some other categories. They've done a great job of archiving and making available a lot of historical (and often still relevant) Amateur Radio data communications software. I haven't explored much of what they offer yet, but doing so is yet another thing that's in my queue.

Zero Retries Guide to Zero Retries Interesting Small Vendors

I decided this was needed so as I develop the archives of Zero Retries, and new issues, I had a single repository to mention all the interesting Zero Retries Interesting hardware products and projects I discover and consider worth mentioning. It's certainly not complete (done), but it is usable so I decided to mention it this week.

Leave a comment

Share

Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out
Join the Fun on Amateur Radio for some pointers.

Zero Retries Frequently Asked Questions (FAQs) — In development 2023-02.

Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with radio technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to everyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing ***Thanks*** to:

- Tina Stroh KD7WSF for, well, *everything!*

- ***Founding Members*** **who generously support Zero Retries financially:**
  Founding Member 0000 - Steven Davidson K3FZT (Renewed 2024)

  Founding Member 0002 - Chris Osburn KD7DVD (Renewed 2024)
  Founding Member 0003 - Don Rotolo N2IRZ (Renewed 2024)
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  Founding Member 0005 - Ben Kuhn KU0HN
  Founding Member 0006 - Todd Willey KQ4FID
  Founding Member 0007 - Merik Karman VK2MKZ
  Founding Member 0008 - Prefers to Remain Anonymous 14
  Founding Member 0009 - Prefers to Remain Anonymous 19

- Numerous Annual and Monthly subscribers who also generously support Zero Retries financially!

Want to Support Zero Retries?

- The *most* effective way to support Zero Retries is to simply mention Zero Retries to your co-conspirators that are also interested in knowing more about technological innovation that is occurring in Amateur Radio and encourage them to become a fellow subscriber.

- One particularly effective method of promoting Zero Retries is to add a mention of Zero Retries to your QRZ page (or other web presence) and include a link:

  https://www.zeroretries.org

- If you'd like to financially support Zero Retries, becoming a paid subscriber is *greatly* appreciated and helps offset expenses incurred in publishing Zero Retries. Paid subscriptions for Zero Retries are *entirely optional*, as explained in this special issue of ZR:
  Zero Retries Administrivia - Activating Payment Options.

These blogs and newsletters regularly feature Zero Retries Interesting content:

- Dan Romanchik KB6NU mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.

- Jeff Davis KE9V also mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.

- Amateur Radio Weekly by Cale Mooth K4HCK is a weekly anthology of links to interesting Amateur Radio stories that often feature "Zero Retires Interesting" topics.

- Experimental Radio News by Bennet Z. Kobb AK4AV discusses (in detail) Experimental

(Part 5) licenses issued by the US FCC. It's a *must-read-now* for me!

- RTL-SDR Blog - *Excellent* coverage of Software Defined Radio units.
- TAPR Packet Status Register has been published continuously since 1982.
- Hot Iron - The Journal of the Constructor's Club is a delightful quarterly newsletter.
- Other Substack Amateur Radio newsletters recommended by Zero Retries.

These YouTube channels regularly feature Zero Retries Interesting content:

- HB9BLA Wireless by Andreas Spiess HB9BLA
- KM6LYW Radio by Craig Lamparter KM6LYW (home of the DigiPi project)
- Modern Ham by Billy Penley KN4MKB
- Tech Minds by Matthew Miller M0DQW

These podcasts regularly feature Zero Retries Interesting content:

- Ham Radio Workbench by George Zafiropoulos KJ6VU (and friends)
- Foundations of Amateur Radio by Onno Benschop VK6FLAB

Zero Retries is currently using the Substack email publishing platform to publish Zero Retries. It's particularly suitable for small newsletters as you can get started for no cost.

If you're reading this issue on the web and you'd like to see Zero Retries in your email Inbox every Friday afternoon, just click below to join ***1800+*** other subscribers:

Subscribe now

Please tell your co-conspirators about Zero Retries — just click:

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Offering **feedback or comments** for Zero Retries is equally easy — just click:

Leave a comment

If you're a fellow smart person that uses **RSS**, there *is* an **RSS feed for Zero Retries**.

Social Media:

Zero Retries (N8GNJ) is on Mastodon — n8gnj@mastodon.radio — just click:

Zero Retries / N8GNJ on Mastodon

Zero Retries (N8GNJ) is also on Bluesky — @n8gnj — just click:

Zero Retries / N8GNJ on Bluesky

Email issues of Zero Retries are "instrumented" by Substack to gather basic statistics about opens, clicking links, etc.

More bits from Steve Stroh N8GNJ:

- SuperPacket blog — *Discussing new generations of Amateur Radio Data Communications — beyond Packet Radio (a precursor to Zero Retries)*
- N8GNJ blog — *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs — Bellingham, Washington, USA*

Thanks for reading!
Steve Stroh N8GNJ / WRPS598 (He / Him / His)
These bits were handcrafted (by a mere human, not an Artificial Intelligence bot) in beautiful Bellingham (The City of Subdued Excitement), Washington, USA, and linked to the Internet via **Starlink *Satellite* Internet Access**.

2024-07-12

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Footnotes for this Issue

1

I did a brief web search for this story but didn't find any references. This story is not related to Job's famous commencement speech about "looking back and connecting the dots".

2

AllStarLink definitely falls within the scope of Zero Retries Interesting subjects… but there are so many such subjects, and KJ7T covers it so well.

3

Yes, there are a few exceptions of special handling of different types of data within TCP/IP such as IP Multicast. And there are also Quality of Service (QOS) mechanisms that can be used.

4

In the linked article, radios supporting DV Fast Data include the ID-52A/E, IC-705, and IC-9700, and hopefully VHF / UHF radios introduced since those radios such as the IC-905.

5

Again, there are exceptions - there have been RTTY repeaters, and some data repeaters such as the Puget Sound Amateur Radio TCP/IP Network, Icom D-Star DD mode data repeaters (many still active), and even 56 kbps data repeaters based on the WA4DSY 56k modem.